DOCUMENT RESUME

ED 400 862 JC 960 186

AUTHOR Clagett, Craig A.
TITLE Correlates of Success in the Community College: Using Research To Inform Campus Retention Efforts. AIR 1996 Annual Forum Paper.
PUB DATE 6 May 96
NOTE 31p.; Paper presented at the Annual Forum of the Association for Institutional Research (36th, Albuquerque, NM, May 1996).
PUB TYPE Viewpoints (Opinion/Position Papers, Essays, etc.) (120) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Academic Achievement; *Academic Persistence; Advisory Committees; Classification; College Transfer Students; Community Colleges; *Outcomes of Education; Program Improvement; *Research Utilization; *School Holding Power; *Student Characteristics; Two Year Colleges
IDENTIFIERS AIR Forum; *Prince Georges Community College MD

ABSTRACT

In response to low graduation and transfer rates among degree-seeking students, Prince George's Community College (PGCC), in Maryland, established a campus-wide retention committee to develop recommendations to improve student achievement. A significant source of information for the committee was a longitudinal student tracking system and a student outcomes typology developed by PGCC's Office of Institutional Research. The typology classifies students as achievers if they receive an award and transfer, transfer only, receive an award only, or have sophomore status in good standing. It further classifies students as persisters if they have fewer than 30 credits earned but are still enrolled, as non-achievers if they are no longer enrolled, and as special motive students if they have short-term and non-degree goals. Using the typology, outcomes as of spring 1994 were determined for 2,386 students who entered PGCC in fall 1990, revealing that nearly 15% (n=351) had earned an award or transferred to a 4-year public college in Maryland, another 13% had achieved sophomore status, and 65% were classified as non-achievers. Based on findings from the analysis, the retention committee developed recommendations related to improving developmental student success, providing support for mathematics instruction, improving departmental retention programs, expanding early intervention initiatives, providing financial support to part-time students, and improving orientation. Contains 17 references. Data tables are appended. (TGI)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED 400 862

Correlates of Success in the Community College:

Using Research to Inform Campus Retention Efforts

Craig A. Clagett
Director of Institutional Research and Analysis
Prince George's Community College
301 Largo Road K-231
Largo, Maryland 20774-2199
301-322-0723
cc5@pgstumail.pg.cc.md.us

Paper presented at the
36th Annual Forum of the
Association for Institutional Research
Albuquerque, New Mexico
May 6, 1996

JC 960 186

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

BEST COPY AVAILABLE

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

C.A. Clagett

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

ABSTRACT

Development of a longitudinal student tracking system facilitated creation of a student outcomes typology useful for both external accountability and internal policy formation. Student achievers were defined as those graduating, transferring, or attaining sophomore status in good standing within four years. Outcomes of 2,386 students entering a large, diverse suburban community college in fall 1990 were determined for several demographic, academic, and socio-economic categories. Logistic regression was employed to identify correlates of student achievement. Thirteen of the 58 independent variables tested were accepted in the model, which correctly classified 87 percent of the cohort. Five variables had partial correlations of .10 or above: cumulative grade point average, summer session attendance, changed curriculum major, always in good academic standing, and mean term credit hour load. A sixth variable, academic good standing in the first term, contributed the greatest added Chi^2. Results of these outcomes analyses influenced the recommendations of a campuswide retention committee.

Community colleges are the great American experiment in higher education. Emphasizing opportunity through their open-admissions policies, community colleges encourage higher learning among many students lacking the basic skills, study habits, and support networks that facilitate success. Many community college students are the first in their families to attend college, making the transition to college complex and challenging (Terenzini, et al., 1994, p. 63):

> Among nontraditional, primarily first-generation, college students, however, the adaptation to college was far more difficult. Indeed, for many, going to college constituted a major *disjunction* in their life course. For these students, college-going was not part of their family's tradition or expectations. On the contrary. Those who were the first in their immediate family to attend college were *breaking*, not continuing, family tradition. For these students, college attendance often involved multiple transitions--academic, social, and cultural.

Committed to their mission, most community colleges continuously strive to ease these transitions and promote student persistence and achievement. This paper describes the recent retention efforts of a relatively large (fall headcount 12,000), diverse (70 percent minority), suburban community college. Two-fifths of the students attending the college are the first in their family to do so.

Background

Continuing concern about the low levels of graduation and transfer of its degree-seeking students prompted the president of Prince George's Community College (PGCC) to appoint a campuswide retention committee in January 1996. Composed of representatives from all five divisions of the college, plus the director of the college's minority student counseling and mentoring program, the Campus Retention Committee was charged with developing recommendations for improving student persistence and achievement and presenting them to the college's Planning Council by July 1, 1996. The college's director of institutional research and analysis, one of the six members of the committee, shared pertinent research findings and student data routinely at the weekly meetings of the committee. He also wrote the committee's interim report to the president. This paper presents highlights from the information shared with the Campus Retention Committee and demonstrates how research findings influenced the committee's recommendations.

Student Outcomes Typology

In response to both external accountability demands and internal decision support needs, the college's office of institutional research and analysis (OIRA) had, during 1994-95, developed longitudinal student tracking files to facilitate student achievement studies. The next step was to create an outcomes typology that (1) was

comprehensible and accepted as legitimate by legislators, accrediting agencies, the public, and all others colleges are appropriately accountable to; (2) took into account the full range of student goals in attending the college; (3) acknowledged student enrollment behavior patterns, including part-time and stop-out attendance; and (4) provided a summary of student accomplishment useful to campus policymakers. Given the nature of community college students, outcomes measures should differ from those developed for four-year institutions (Pascarella, Smart, and Ethington, 1986; Webb, 1989; Seppanen, 1995). An analysis of time to degree of 1,581 associate degree graduates of the City Colleges of Chicago found that nearly a fifth took ten years or more to finish their "two-year" degree. Nearly a fourth of the total time to degree for the entire cohort was accounted for by "stopout time," or time that elapsed while the students were not enrolled. Most notably, nearly half the time to degree was accounted for by "extra time enrolled," time beyond the nominal requirements for the degree. This extra time was due to part-time attendance, time spent earning credits not needed for the associates degree, and time spent in classes that were not completed. Noncredit remedial courses accounted for six percent of the extra time (Garcia Z., 1994). With these issues in mind, the PGCC research office developed the following student outcomes categories based on the data available in its longitudinal cohort tracking system (Clagett, 1995):

1. **Award and transfer.** The percentage of degree-seeking students in an entering cohort who have earned a degree or certificate from the community college *and* transferred to a four-year college or university within the study period. (Depending on how the transfer information is obtained, transfer rates may be underestimated. This is likely for colleges relying on state reporting systems since student transfer to independent colleges or colleges outside the state are often not including in state-mandated reporting systems. This was the case for PGCC.)

2. **Transfer/no award.** The percentage of degree-seeking students transferring to a senior institution without having earned an award from the community college.

3. **Award/no transfer.** The percentage of degree-seeking students earning a degree or certificate from the community college for whom there is no evidence of transfer.

4. **Sophomore status in good standing.** The percentage of degree-seeking students who have not graduated from the community college but who have earned at least 30 credits with a cumulative grade point average of 2.0 or above, and for whom we have no evidence of transfer. Given the proportions of entering students needing remediation and/or attending part-time, reaching sophomore status in good standing represents a notable academic achievement.

Probably included in this category are a number of students who have transferred to independent and out-of-state colleges or universities.

5. **Achievers.** A summary measure of the preceding four categories.

6. **Persisters.** The percentage of degree-seeking students still enrolled at the community college (as of the last term of the study period) who do not fall into any of the above "achiever" categories. They have not graduated or transferred, nor have they earned 30 credits with a 2.0 grade point average. Their outcomes are yet to be determined.

7. **Non-achievers.** The percentage of degree-seeking students exiting the community college without graduating or earning 30 credits in good standing for which we have no evidence of transfer. Included in this group are the true "dropouts" who have not succeeded in reaching their goals within the study period. Some of these students may have transferred early (before accumulating 30 credits) to independent or out-of-state colleges.

8. **Special motive.** Students who had indicated short-term, non-degree goals of personal enrichment or job skill upgrading *and* who attended only during the first two terms of the study period. Never intending to enter a curriculum or transfer, these students are properly excluded from attrition statistics.

The above classification becomes most meaningful when a substantial majority of the cohort has attained their ultimate community college outcome. While this argues for a fairly long study period, say six years or more, another consideration supports a shorter time span. Reporting on cohorts that entered many years ago runs the risk that student characteristics and institutional practices may have changed, so that the findings may not be useful guides for current policymaking. At PGCC, students are classified according to the typology at the end of three, four, five, and six years, with the four-year analysis included in reports to our Board of Trustees and our state higher education commission. Four-year outcomes for the fall 1990 cohort are reported in this paper.

Four-year Outcomes of the Fall 1990 Cohort

A total of 2,643 first-time students entered the college in fall 1990. Of these, 257 indicated they had no intention of earning credits toward a degree, but instead were enrolled for short-term enrichment or specific skill upgrading reasons. Among the 2,386 degree-seeking students, 137 or less than 6 percent had earned an award from PGCC by the end of spring 1994. Another 214 (or 9 percent) had transferred to a four-year public college in Maryland. Thus 351 or nearly 15 percent had earned a degree or transferred within four years of entering the community college. An

additional 314 students, or 13 percent, had earned at least 30 credits at PGCC with a cumulative grade point average of 2.0 or above. Including these sophomores in good standing with the graduates and transfers, the total proportion of fall 1990 entrants classified as achievers within four years was 28 percent.

Student Outcomes After Four Years
Outcomes as of the End of Spring 1994 of Students Entering in Fall 1990

Outcome	Number	Percent
Award and transfer	54	2%
Transfer, no award	214	9%
Award, no transfer	83	4%
Sophomore w/2.0+ GPA	314	13%
Achievers	665	28%
Enrolled Spr 94 <30 credits/2.0	174	7%
Non-achievers	1,547	65%
Total degree-seeking students	2,386	100%
Special motive (excluded from above)	257	

These outcome patterns varied by race/ethnicity, with Asian-Americans, white Americans, and international students achieving at higher rates than African-Americans and Hispanic-Americans. African-American and white students accounted for nearly nine in ten students in the cohort. White females had relatively high achievement levels. Forty-two percent of the white women had either graduated, transferred, or attained sophomore status in good standing within four years of entry to PGCC. This was slightly better than the white men, 38 percent of whom were classified as achievers according to the typology. In contrast, the achievement rates of African-American men and women were lower. Nineteen percent of the African-

American women were classified as achievers. Only 13 percent of the African-American men had graduated, transferred, or attained sophomore status in good standing within four years.

Student Outcomes After Four Years, by Race/Ethnicity and Sex
Outcomes as of the End of Spring 1994 of Students Entering in Fall 1990

Outcome	African American Males	African American Females	White American Males	White American Females
Award and transfer	1%	1%	4%	4%
Transfer, no award	4%	4%	15%	15%
Award, no transfer	2%	3%	3%	7%
Sophomore w/2.0+ GPA	6%	11%	16%	17%
Achievers	13%	19%	38%	42%
Enrolled Spr 94 <30 credits/2.0	7%	10%	5%	5%
Non-achievers	79%	71%	57%	53%
Total degree-seeking students (100%)	463	717	400	496
Special motive (excluded from above)	30	88	40	73

The next step in the longitudinal cohort analysis involved an examination of student patterns of attendance, to see if they were associated with student outcomes four years after entry. As expected, students attending in fall 1990 and at most only one other term were unlikely to attain achiever status as defined in the OIRA typology. Only four percent of these short-term attenders were classified as achievers, almost all through early transfer to a senior institution in Maryland. Among those students attending at least three terms, however, a substantial difference was found. Students

who attended the first three major terms (fall 1990, spring 1991, and fall 1991) were more than twice as likely to be achievers than students who were absent in either the spring or fall of 1991. A majority of those getting off to a "good start" had graduated, transferred, or attained sophomore status in good standing within four years of entry, compared to only 22 percent of those who attended three or more terms but did not enroll in all of the first three major terms. Students with the "good start" attendance pattern of enrolling in at least the first three terms without interruption had higher rates of graduation, transfer, and sophomore attainment:

Outcomes After Four Years, by Attendance Pattern
Degree-seeking Students Entering in Fall 1990

Outcome	"Good Start" (First 3 Terms)	3 or More Other Terms	1 or 2 Terms
Award and transfer	5%	1%	0%
Transfer, no award	16%	5%	4%
Award, no transfer	7%	4%	0%
Sophomore w/2.0+ GPA	26%	13%	<1%
Achievers	54%	22%	4%
Enrolled Spr 94 <30 credits/2.0	8%	23%	2%
Non-achievers	38%	55%	94%
Total degree-seeking students (100%)	1,030	309	1,047

This pattern held true for African-American students at the college. Thirty-seven percent of the African-Americans getting off to a "good start" had graduated, transferred, or attained sophomore status, compared to only 12 percent of the African-Americans attending three or more terms but not all of the first three.

Developmental Education and Student Achievement

How did the need for remediation affect outcomes? Earlier OIRA studies had found that mathematics ability was a key predictor of success, a finding consistent with Windham (1995). Exploratory studies at PGCC had suggested that students needing remediation in mathematics and at least one other area--reading or English composition or both--were at greatest risk of not succeeding. This proved true for the fall 1990 cohort. Only 11 percent of the students identified as needing developmental courses in mathematics and at least one other area were classified as achievers after four years. In contrast, students with no developmental needs achieved at a rate of 44 percent. Adding in persisters--students enrolled at PGCC the last term of the study period--found half of the students not needing remediation successful, compared to only 20 percent of the "developmental math plus" group. Among full-time students, 56 percent of the non-developmental group--compared to 17 percent of the developmental math plus group--had graduated, transferred, or attained sophomore status in good standing within four years.

Student Outcomes After Four Years, by Developmental Need
Outcomes as of the End of Spring 1994 of Students Entering in Fall 1990

Outcome	No Developmental Needed		Developmental Math Plus	
	Total	Full-time	Total	Full-time
Award and transfer	4%	7%	<1%	1%
Transfer, no award	17%	24%	2%	4%
Award, no transfer	5%	6%	1%	2%
Sophomore w/2.0+ GPA	18%	19%	7%	9%
Achievers	45%	56%	11%	17%
Enrolled Spr 94 <30 credits/2.0	5%	4%	9%	7%
Non-achievers	50%	40%	80%	76%
Total degree-seeking students (100%)	861	536	628	281

Achievement levels varied by the number of skill areas needing remediation. Twenty-eight percent of the students needing remediation in only one basic skill had graduated, transferred, or attained sophomore status in good standing within four years of entry to PGCC. Achievement rates dropped to 17 percent for those needing developmental in two areas, and 11 percent for those needing developmental classes in all three areas of mathematics, reading, and composition.

Achievement After Four Years and Developmental Status
Percent Graduating, Transferring, or Attaining Sophomore Status
Fall 1990 First-time Student Cohort

	Number of Students	Percent of Cohort	Percent Achievers
BASIC SKILLS ASSESSMENT (n = students tested in all 3 areas)			
No developmental courses needed	861	42%	45%
Developmental courses needed	**1,170**	**58%**	**18%**
In one area	390	19%	28%
In two areas	380	19%	17%
In three areas	400	20%	11%
DEVELOPMENTAL PROGRESS (n = students identified as needing developmental)			
No developmental courses taken	262	22%	21%
Dev. courses taken/none passed	214	18%	4%
Course(s) passed/no area completed	198	17%	11%
Some, but not all areas completed	315	27%	15%
All developmental work completed	**181**	**16%**	**46%**

Achievement also reflected student progress through recommended developmental courses. A fifth of the students initially identified as needing remediation by testing did not take developmental courses, due to early attrition, avoidance, waivers granted by counselors, or through re-testing. These students attained an achievement rate of 21 percent, compared to 45 percent for students not needing remediation. Students who took developmental courses but failed to pass them had an achievement rate of 4 percent. Students passing at least one developmental course, but not completing required remediation in any skill area, had

an achievement rate of 11 percent. Fifteen percent of the students completing remediation in at least one skill area, but not all skill areas of need, achieved. Most notably, 46 percent of the students needing remediation who completed all developmental work recommended achieved. While only accounting for 16 percent of the students needing remediation, these developmental completers achieved at the same rate as students not needing developmental courses.

Interactive Effects

Achievement rates were calculated for several academic variables, each of which appeared to be associated with student success. The more terms a student attended, and the more credits carried each term, the higher the achievement. Students who attended without interruption had higher achievement rates than students who interrupted their studies. And students who were always in good academic standing had higher achievement rates than those who attended one or more terms on academic probation or restriction. In reality, of course, the factors inhibiting or facilitating academic success are cumulative and interactive. One way to see this is to calculate the achievement rates of successive sub-samples created by adding criteria one at a time, steadily decreasing the size of the sample by more narrowly defining it. Beginning with the total degree-seeking cohort of 2,386 students, that collectively generated a 28 percent achievement rate, the addition of each additional criterion raised the achievement rate substantially. The sub-sample of all full-time degree-seeking students, accounting for a third of the total cohort, had an achievement rate of 45 percent. Nearly three-fifths of the full-timers who were tested and did not need remediation had graduated, transferred, or achieved sophomore status in good standing. The achievement rates for each successive sub-sample, and the number and percent of students represented, were as follows:

Percent Achievers, by Cumulative Academic Characteristics

Cumulative Criteria Sub-samples	Number of Students	Percent of Cohort	Percent Achievers
All degree-seeking students	2,386	100%	28%
▸Mean term credit load 12+	773	32%	45%
▸No remediation required	414	17%	59%
▸Attended 3 + major terms	249	11%	83%
▸Continuously enrolled	194	8%	90%
▸Always in good standing	169	7%	96%

Ninety-six percent of the cohort degree-seekers who attended full-time, had college-level basic skills at entry, attended three or more terms without interruption, and were always in good academic standing, succeeded according to our definition. For those students who came to the college with an adequate academic background, were able to make a commitment to full-time, uninterrupted study, and who studied sufficiently to earn passing grades, success was almost certain. The explanation for the poor overall achievement rates at PGCC is that so few of the college's students fit this profile. Windham (1995) came to similar conclusions in her study at Tallahassee Community College.

Socio-economic Status and Student Achievement

Like many community colleges, Prince George's requires relatively little background information on its application form. The college's open admissions policy, plus its commitment to customer service and ease of entry had yielded a brief application form with no requests for household income or other socio-economic data. However, the research office had developed a geo-demographic, lifestyle-cluster system based on student addresses that allowed inferences concerning student socio-economics (Boughan, 1993). Although originally developed for student recruitment and enrollment management purposes, the office quickly realized that PG-TRAK© could be used in outcomes research as well. The system identified twelve neighborhood types based on cluster-analyzing income, occupation, ethnicity, housing, family life cycle, and other census data at the tract level. A composite socio-economic-status (SES) variable was constructed to provide a capsule summary of the relative rank of each neighborhood cluster, and descriptive nicknames were assigned to each.

PG-TRAK© cluster codes were included in the variable set used to analyze the outcomes of the fall 1990 cohort. The percent of students graduating, transferring, or attaining sophomore status in good standing within four years varied by neighborhood type, from a low of 14 percent of the students residing in the City Line neighborhoods (primarily African-American, with many single parents, high levels of unemployment and public assistance) to a high of 50 percent in Beltway Havens (majority white neighborhoods of single-family detached houses, affluent but with modest educational levels).

Student achievement levels appeared to be related to neighborhood racial and ethnic mix as well as income or occupational rank. The top six clusters in student achievement were composed of majority white neighborhoods, while the bottom six had predominantly minority populations. Students residing in Black Enterprise, the most affluent cluster with the highest median household income, highest percentage of white-collar executive jobholders, and most expensive homes, had an average achievement level of 29 percent. Black Enterprise was somewhat an exception, however, as student achievement clearly tracked socio-economic status.

Percent Achievers, by PG-TRAK Neighborhood Cluster		
PG-TRAK Neighborhood Cluster	SES Rank	Percent Achievers
Beltway Havens	5	50%
Exurban Elite	3	40%
Cosmopolitans	2	38%
Old County	9	34%
Rural Development	6	30%
Upwardly Mobiles	4	29%
Black Enterprise	1	29%
Ethnic Mix	11	27%
Black Middle America	7	26%
Minority Comers	8	25%
Afro Blue Collar	10	20%
City Line	12	14%

Exploratory Multivariate Analysis

To determine whether the correlations of the various independent variables were spurious, and which of the nonspurious variables contributed the most to our understanding of student achievement, logistic regression was employed (Boughan and Clagett, 1995). Logistic regression is appropriate for studies with a dichotomous dependent variable, as in achievement/nonachievement. Fifty-eight independent variables were included in the analysis, which was deliberately exploratory in intent. The independent variables included demographics (e.g., age, sex, race/ethnicity, socio-economic status), entry status (immediate entry from high school, type of high school), study objectives (e.g., transfer, job preparation), curriculum (type, specific major, changes), remedial status (need and progress), attendance descriptors (e.g., average credit hour load, campus/extension, day/evening, summer sessions), and academic performance (e.g., academic standing, first-term and cumulative grade point average). Variables concerning credit accumulation (terms attended, hours earned) were excluded since they were dimensions of the dependent variable. Obviously, many other variables plausibly related to student persistence and achievement could not be included since the appropriate data were not available.

Thirteen of the 58 independent variables tested made it into the model. The overall model exhibited impressive goodness-of-fit. A measure of the proportional reduction in error, obtained by subtracting the -2 Log Likelihood statistic for the model from the -2 Log L statistic for the model containing the intercept only and dividing the difference by the latter (St. John, Kirshstein, and Noell, 1991; Hanson and Swann, 1993), suggested that the model explained 55 percent of the variance in student achievement. The resulting equation correctly classified 87 percent of the students into their proper achievement category. To corroborate the logistic model, the same variables were run through both standard linear multiple regression and discriminant function analyses, even though they were less appropriate technically. The linear regression produced an R^2 of 47 percent of the variance explained, while the discriminant function properly placed 86 percent of the cohort.

Logistic Regression Model Equation Statistics				
Independent Variable	Entry Step	Added *Chi*^{2}	*R* Partial Corr.	Raw *Eta* Corr.
Cumulative GPA	3	226.8	.250	.560
Summer session attendance	2	333.3	.213	.443
Change in curriculum	5	89.6	.156	.281
Always in good standing	6	47.3	.125	.462
Average term credit load	4	253.3	.103	.361
Developmental completed	10	5.0	.051	.112
Credit load in first term	8	11.9	.047	.356
Developmental coursetaking	11	7.2	-.045	.196
No curriculum choice	9	8.3	-.041	.125
Good standing first term	1	529.1	.036	.466
Immediate entry from high school	7	33.4	.035	.188
"New Collar" program major	12	4.7	.034	.115
Under 21 years of age at entry	13	4.3	.029	.191

Of more interest was which variables made it into the model, and how much explanatory power each contributed. To help answer these questions, three indicators are included in the above table: the entry step; the added *Chi*^{2}, suggesting how

much each new variable contributed to the joint power of the growing multivariate model; and the *R* partial correlation, indicating the independent variable's singular power to determine the behavior of the dependent variable bounded by the set of other independent variables. Also included for reference are the simple bivariate *eta* correlations.

Six variables qualified as major contributors to explaining student achievement. The student's cumulative grade point average was the top explanator, with a robust .25 partial correlation and added Chi^2 of 226.8. Summer session attendance was also strong on both statistics. Change in curriculum and always being in good academic standing had partial correlations of .156 and .125 respectively, although relatively modest contributions to added Chi^2. Mean major term average credit hour load had an *R* of .103 and added considerably to the joint Chi^2. Being in good academic standing in the first term, though with a modest partial correlation when the other variables were added to the equation, nevertheless was the first variable entering the model and accounted for the highest added Chi^2. All six variables had zero-order correlations with student achievement of at least .28.

With the exception of age, no demographic or social background variables survived analysis. Neither race/ethnicity, sex, or any of the numerous socio-economic measures tested were accepted into the model. Subsequent regressions of the background variables only upon student achievement yielded models with relatively poor goodness-of-fit. However, further analysis did find that the background variables added significantly to explaining variation in particular intervening variables, such as credit load and remediation need. Similarly, most of the variables relating to developmental need and coursetaking did not satisfy the criteria of the model, yet in separate regressions they did help explain variation in several academic performance variables. The clear implication is that causal modeling such as path analysis is required to more fully understand the interactions among explanatory variables.

The high explanatory power of cumulative grade point average, being in good academic standing, and average credit hour load underscored the centrality of taking courses and getting good grades in explaining persistence and graduation (findings consistent with Romano, 1995). Summer session attendance might be an indication of motivation and commitment, as might change in curriculum. Having a clear goal might promote achievement. Pursuing a "new collar" curriculum in health technology, criminal justice, or paralegal studies might also inspire the motivation of having a clear near-term goal. The negative partial correlation of not having made a curriculum choice supports this argument.

The "good start" variable (attending the first three major terms) was omitting from the first logistic regression analysis of the whole cohort. When a separate regression was run against a dataset including only students attending beyond the first year, the good start variable made the model with an *R* of .12.

Additional Research

In addition to the findings from the exploratory logistic regression and earlier longitudinal cohort analyses, the research office updated its annual examination of course pass rates and assisted in an unusual qualitative research effort.

Course Pass Rate Analysis

Course pass rates were calculated from final grade distributions. The pass rates equals the percentage of initial course enrollees receiving passing grades, including D and TP (toward passing) grades. The more failures and withdrawals, the lower the pass rate. Pass rates were computed for each division, department, discipline, and course at the college. Pass rates were also computed for students subgroups based on age, sex, race, and admission status (Diehl, 1996). The twelve courses with the lowest pass rates in fall 1995 are shown in the following table:

Courses with Low Pass Rates, Fall 1995
Percent of Initial Enrollees Receiving Passing Grades

Course	Enrollments	Percent Passing
DVM 003	545	44%
DVM 004	335	47%
DVM 001	216	48%
CHM 101	251	56%
DVM 007	216	57%
MAT 241	120	58%
BIO 201	156	58%
MAT 107	264	61%
MAT 125	223	61%
MAT 108	128	62%
MAT 114	185	63%
MAT 112	639	63%
College total	26,786	75%

Ten of the twelve courses with the lowest pass rates in fall 1995 were in mathematics or developmental mathematics. The college's placement testing had consistently documented the poor mathematics preparation of entering students, and earlier studies of course pass rates had found similar results, so these fall 1995 findings were not unexpected.

Qualitative Research

Qualitative research methods such as focus groups add richness and insights unobtainable from quantitative analysis (Engleberg and Cohen, 1989; Bers, 1994). Such insights can be especially valuable in designing retention programs; Kinnick and Ricks (1993, p. 68) have argued that "retention cannot be reduced to pure numbers when educational improvement is the aim." They continued:

> (L)istening to and faithfully representing the student voice to policymakers is an increasingly important function for institutional research. In addition, students view such efforts positively and want to become more involved. As students become more involved, the gap between the researchers and the objects of their research narrows and informed problem solving increases.

Early in the 1990s, the college had investigated its racial climate as perceived by employees and students, both through written surveys and focus groups (Boughan, 1992). A more novel approach to qualitative research was utilized in the spring of 1996. The director of institutional research taught a class session of Honors Speech 101 on using information in persuasive speaking. Much of the campus retention research was presented to the class, which had the assignment of recommending retention strategies and arguing their merits at a subsequent class meeting. Three members of the Campus Retention Committee sat in on the student speeches at the later class, and participated in the ensuing discussion. Much was learned from the opinions of the now well-informed students.

Application: Campus Retention Committee

The findings from the longitudinal cohort analysis, zero-order correlations with student achievement, logistic regression and other multivariate analyses, course pass rate analysis, and qualitative research were discussed at length by the Campus Retention Committee at weekly meetings over a two-month period. The research findings clearly influenced the preliminary recommendations of the committee, as reflected in its March 1996 progress report. Several committee recommendations, reproduced verbatim from the committee report, follow:

Improve developmental student success. Campus research suggests that students who complete all required developmental courses achieve *at the same rate as* students entering the college without basic skill deficiencies. However, campus research also shows that relatively few students identified as needing developmental education succeed in completing remediation. The Campus Retention Committee believes that assisting students through completion of all developmental requirements should be a top priority of the college.

Support mathematics instruction. Three-fifths of the students entering PGCC each fall need remediation in mathematics, a proportion nearly twice that needing developmental reading or composition. The three PGCC courses with the lowest completion rates--with less than half of students passing--are in developmental mathematics (DVM 001, 003, and 004). Six of the eight credit courses with the lowest pass rates on campus are in mathematics (MAT107, 108, 112, 114, 125, and 241). The Campus Retention Committee believes strategies need to be developed and implemented to assist students in mathematics.

Initiate/expand departmental retention programs. Research shows that student success varies by student major and by course discipline. Academic departments should establish retention programs tailored to their disciplines and the goals of their students. Departments might focus on courses with low student pass rates, on the appropriateness of placement test score course prerequisites, and on the effectiveness of 100-level preparatory courses. Departments should annually report on the nature and success of their programs to the Campus Retention Committee.

Pilot test Freshman Academy. Students with multiple basic skills deficiencies, poor or nonexistent study habits, no family history of college attendance, peers unsupportive of academic endeavors, and without clear and realistic goals, need a comprehensive and intensive support system. Anything less will have at best a marginal impact on the overall success of this group. While actions such as Early Alert letters and walk-in tutoring services may be components of a more comprehensive program, by themselves they have had a minimal impact on the most at-risk students enrolled at the college. A full-time, five-days-a- week, cluster-scheduled program delivered by credit and developmental faculty teams and incorporating structured study groups, career and personal counseling, and other support services should be undertaken on a pilot basis, to see if college actions can produce meaningful improvements in the success of the most at-risk students enrolling at the college. The Academy should be three semesters in duration; campus research shows that students beginning their college careers by attending three consecutive terms are more than twice as likely to succeed as students not getting off to this good start.

Expand early intervention programs. The Campus Retention Committee believes that the sooner academic difficulties are identified and interventions initiated, the greater the likelihood of student success. The Early Alert program should be expanded to include personal follow-up contacts with all identified students. Notifying a student that he or she is in academic difficulty is not enough. The system should alert intervention teams as well as the student; the institution should be obligated to implement intervention programs once students in academic trouble have been identified.

Increase faculty involvement in student support services. The Campus Retention Committee believes that the college should train and use more faculty members in arena registration, ongoing student advisement, college activities, mentoring programs, high school recruitment, and other student support activities. The national literature, and preliminary findings from an evaluation of the college's mentoring program, suggest that student-faculty interactions outside the classroom can promote student commitment and persistence.

Provide tuition scholarship aid to achieving, part-time students. Campus research shows that many high-achieving students, with grade point averages of 3.0 and above, discontinue their studies--in many cases due to financial difficulties. Research also shows that students who "stop out" succeed at one-fourth the rate of students able to continue their studies without interruption. The Campus Retention Committee recommends that financial assistance be targeted to part-time, employed adult students with proven PGCC course histories facing financial barriers to uninterrupted enrollment.

Improve student orientation to college. Research shows that over a fourth of the students entering the college each fall will not return for a second term. The Campus Retention Committee recommends revision of the college's program for assisting students in their transition to college, including better promotional campaigns to inform students about the support programs available, the success of students who complete developmental studies, and the advantages of remaining at PGCC through degree completion. The college should investigate the effectiveness of the CAP 102 achieving college success course, and consider the merits of a one-credit college transition/orientation class with greater student participation.

It remains to be seen how many of these recommendations are implemented, and how effective they are in improving student performance. The research office will be involved in the design and implementation of evaluation plans for each implemented recommendation. The overarching goals of the Campus Retention Committee were to promote degree-seeking student persistence (1) through course completion, (2) from term-to-term, and (3) to student goal achievement. Methodologies for measuring each form of persistence were already in place, having

been developed by the institutional research office prior to appointment of the retention committee. The committee reviewed and endorsed the indicators, most of which have been illustrated in this paper. More important to the success of the committee's efforts, however, will be campus leadership and follow-through. Only the commitment of both people and resources will allow the college to see if it can make a difference.

The spirit of the retention committee's recommendations is in accord with the sentiments expressed by Terenzini et al. (1994, p. 72):

> In the past, we have tended to develop new student support programs implicitly assuming that the challenge is to help students adapt to the institution...For nontraditional and diverse students, however, the logic needs to be reversed: Institutions must seek ways in which *they* can change so as to accommodate the transitional and learning needs of first-generation and other nontraditional students. Some students will flourish in their new environment without institutional intervention. Others, however, will require assistance that is initiated by institutional representatives--faculty and staff. Faculty cannot assume that their sole responsibility is to teach and advise, and that if students do not take advantage of what they have to offer it is the student's problem. The burden of responsibility for taking advantage of transition support mechanisms cannot rest with the student alone.

Bibliography

Bers, T. (1994). "Focus Group Research: Community College Applications." *Journal of Applied Research in the Community College* 2(1):5-19.

Boughan, K. (1992). *Student Perceptions of the Racial Climate at Prince George's Community College*. Office of Institutional Research and Analysis, Prince George's Community College, Largo, Maryland.

Boughan, K. (1993). "The Geo-demographic Approach to Student Recruitment: The PG-TRAK© Lifestyle Cluster System." *Journal of the Maryland Association for Institutional Research* 2:1-15.

Boughan, K. and Clagett, C. (1995). "A Student Outcomes Typology for Community Colleges: Identifying Achievers with Longitudinal Cohort Analysis." Paper presented at the 22nd Annual Conference of the North East Association for Institutional Research, Burlington, Vermont.

Clagett, C. (1995). "An Outcomes Typology for Community Colleges." *Assessment Update* 7(4):10-11.

Diehl, P. (1996). *Course Pass Rates in Fall 1995*. Office of Institutional Research and Analysis, Prince George's Community College, Largo, Maryland.

Engleberg, I., and Cohen, M. (1989). "Focus Group Research in the Community College." *Community/Junior College Quarterly of Research and Practice* 13(2):101-108.

Garcia Z., Rodolfo (1994). "The Long and Winding Road to the Associate's Degree: Stories Transcripts Tell." *Journal of Applied Research in the Community College* 1(2):153-166).

Hanson, G. and Swann, D. (1993). "Using Multiple Program Impact Analysis to Document Institutional Effectiveness." *Research in Higher Education* 34(1):71-94.

Kinnick, M. and Ricks, M. (1993). "Student Retention: Moving from Numbers to Action." *Research in Higher Education* 34(1):55-69.

Pascarella, E., Smart, J., and Ethington, C. (1986). "Long-term Persistence of Two-year College Students." *Research in Higher Education* 24(1):47-71.

Romano, R. (1995). "First-year Attrition and Retention at a Community College." *Journal of Applied Research in the Community College* 2(2):169-177.

Seppanen, L. (1995). "A Shoe that Fits: A Methodology for Tracking Student Progress in Community Colleges." Paper presented at the Thirty-fifth Annual Forum of the Association for Institutional Research, Boston.

St. John, E., Kirshstein, R., and Noell, J. (1991). "The Effects of Student Financial Aid on Persistence: A Sequential Analysis." *The Review of Higher Education* 14(3):383-406.

Terenzini, P., Rendon, L., Upcraft, M., Millar, S., Allison, K., Gregg, P., and Jalomo, R. (1994). "The Transition to College: Diverse Students, Diverse Stories." *Research in Higher Education* 35(1):57-73.

Webb, M. (1989). "A Theoretical Model of Community College Student Degree Persistence." *Community College Review* 16(4):42-49.

Windham, Patricia (1995). "The Relative Importance of Selected Factors to Attrition at a Public Community College." *Journal of Applied Research in the Community College* 3(1):65-78.

Appendix

Percent Achievers After Four Years, Fall 1990 Entrants Graduating, Transferring, or Attaining Sophomore Status in Good Standing			
	Number of Students	Percent of Cohort	Percent Achievers
OVERALL ACHIEVEMENT RATE			
Total degree-seeking cohort	2,386	100%	28%
CREDIT HOURS ATTEMPTED			
No credit courses taken	197	8%	0%
1 - 5 credit hours attempted	338	14%	0%
6 - 11	437	18%	0%
12 - 17	291	12%	2%
18 - 23	219	9%	4%
24 - 29	175	7%	18%
30 - 44	301	13%	71%
45 - 59	212	9%	93%
60 or more credits attempted	216	9%	98%
CREDIT HOURS EARNED			
No credit courses taken	197	8%	0%
Credits attempted/none earned	217	9%	0%
1 - 5 credits earned	374	16%	0%
6 - 11	355	15%	1%
12 - 17	237	10%	2%
18 - 23	188	8%	5%
24 - 29	154	7%	23%
30 - 44	261	11%	87%
45 - 59	198	8%	95%
60 or more credits earned	205	9%	100%

BEST COPY AVAILABLE

	Number of Students	Percent of Cohort	Percent Achievers
AVERAGE CREDIT HOUR LOAD			
Mean term credit load 15+	104	4%	59%
12 - 14 credit hours	669	28%	43%
9 - 11 credit hours	558	23%	37%
6 - 8 credit hours	544	23%	19%
< 6 credit hours per term	511	21%	4%
DEVELOPMENTAL EDUCATION ASSESSMENT			
No developmental courses needed	861	36%	45%
Developmental courses needed	1,170	49%	18%
Not assessed in all 3 areas	355	15%	
FEDERAL FINANCIAL AID			
Received federal aid	529	22%	40%
No federal aid	1,857	78%	25%
NUMBER OF FALL AND SPRING TERMS ATTENDED			
Attended 7 - 8 major terms	276	12%	72%
5 - 6 terms	440	18%	55%
3 - 4 terms	623	26%	31%
1 - 2 terms	1,047	44%	4%
ENROLLMENT PATTERN			
Continuous enrollment	809	34%	58%
Interrupted enrollment	1,577	66%	13%
"GOOD START" INITIAL ENROLLMENT			
Attended first three major terms	1,030	43%	54%
Other attendance patterns	1,356	57%	8%
ACADEMIC STANDING			
Always in good standing	849	36%	58%
At least one term not g.s.	1,537	64%	12%

	Number of Students	Percent of Cohort	Percent Achievers
CUMULATIVE GRADE POINT AVERAGE			
No credits attempted	197	8%	0%
0.0 cumulative GPA	217	9%	0%
0.1 - 0.9 GPA	167	7%	0%
1.0 - 1.4 GPA	213	9%	0%
1.5 - 1.9 GPA	225	9%	4%
2.0 - 2.4 GPA	410	17%	46%
2.5 - 2.9 GPA	387	16%	64%
3.0 - 3.4 GPA	347	15%	48%
3.5 - 4.0 GPA	223	9%	28%
CUMULATIVE GRADE POINT AVERAGE 2.0+			
Cumulative GPA 2.0 +	1,367	57%	49%
Cumulative GPA < 2.0	1,019	43%	1%
RACE/ETHNICITY			
African American	1,180	49%	17%
Asian American	73	3%	42%
Hispanic American	52	2%	21%
Native American	11	<1%	18%
White American	896	38%	41%
International student	174	7%	37%
AGE AT ADMISSION IN FALL 1990			
Under 20 years	1,536	64%	35%
20 to 24	410	17%	17%
25 years and older	440	18%	17%
GENDER			
Female	1,379	58%	29%
Male	1,007	42%	27%

Fall 1990 Entrants After Four Years, by Age Group Percentage Distributions			
	Under 20	20 - 24	25 and Older
AVERAGE CREDIT HOUR LOAD			
Mean term credit load 15+	6%	4%	1%
12 - 14 credit hours	38%	18%	3%
9 - 11	30%	16%	8%
6 - 8	19%	31%	28%
< 6 credit hours per term	8%	32%	60%
CREDIT HOURS EARNED			
No credit courses taken	7%	10%	10%
Credits attempted/none earned	8%	14%	7%
1 - 5 credits earned	14%	17%	20%
6 - 11	13%	16%	19%
12 - 17	9%	11%	12%
18 - 23	7%	9%	10%
24 - 29	7%	6%	7%
30 - 44	13%	7%	8%
45 - 59	10%	5%	5%
60 or more credits earned	11%	4%	4%
CUMULATIVE GRADE POINT AVERAGE			
No credits attempted	7%	10%	10%
0.0 cumulative GPA	8%	14%	7%
0.1 - 0.9 GPA	9%	3%	2%
1.0 - 1.4 GPA	10%	9%	5%
1.5 - 1.9 GPA	11%	9%	6%
2.0 - 2.4 GPA	19%	15%	13%
2.5 - 2.9 GPA	18%	11%	15%
3.0 - 3.4 GPA	13%	15%	20%
3.5 - 4.0 GPA	4%	13%	23%

Percentage Distributions			
	Under 20	20 - 24	25 and Older
DEVELOPMENTAL EDUCATION ASSESSMENT (n = students tested in all 3 areas)			
No developmental courses needed	47%	36%	27%
Developmental courses needed	**53%**	**64%**	**73%**
In one area	18%	18%	26%
In two areas	17%	22%	22%
In three areas	18%	23%	24%
DEVELOPMENTAL PROGRESS (n = students identified as needing developmental)			
No developmental courses taken	18%	29%	34%
Dev. course(s) taken/none passed	20%	20%	10%
Course(s) passed/no area completed	18%	17%	13%
Some, but not all areas completed	27%	23%	30%
All developmental work completed	**17%**	**11%**	**14%**
OUTCOMES			
Award and transfer	3%	1%	1%
Transfer, no award	13%	4%	1%
Award, no transfer	4%	3%	3%
Sophomore in good standing	14%	9%	11%
Achievers	**35%**	**17%**	**17%**
Still enrolled	6%	8%	11%
Non-achievers	60%	76%	72%
TOTAL STUDENTS (100%)	1,536	410	440

Fall 1990 Entrants After Four Years, by Race/Ethnicity Percentage Distributions			
	Afr-Amer	White	Internatnl
AVERAGE CREDIT HOUR LOAD			
Mean term credit load 15+	1%	8%	4%
12 - 14 credit hours	23%	35%	24%
9 - 11	24%	21%	29%
6 - 8	29%	15%	29%
< 6 credit hours per term	23%	21%	15%
CREDIT HOURS EARNED			
No credit courses taken	12%	5%	3%
Credits attempted/none earned	13%	5%	5%
1 - 5 credits earned	20%	13%	9%
6 - 11	15%	15%	13%
12 - 17	11%	9%	12%
18 - 23	7%	8%	8%
24 - 29	5%	6%	11%
30 - 44	8%	14%	19%
45 - 59	5%	12%	11%
60 or more credits earned	4%	14%	9%
CUMULATIVE GRADE POINT AVERAGE			
No credits attempted	12%	5%	3%
0.0 cumulative GPA	13%	5%	5%
0.1 - 0.9 GPA	9%	6%	3%
1.0 - 1.4 GPA	11%	8%	6%
1.5 - 1.9 GPA	11%	7%	12%
2.0 - 2.4 GPA	19%	15%	17%
2.5 - 2.9 GPA	12%	20%	21%
3.0 - 3.4 GPA	9%	20%	18%
3.5 - 4.0 GPA	5%	14%	16%

Percentage Distributions			
	Afr-Amer	White	Internatnl
DEVELOPMENTAL EDUCATION ASSESSMENT (n = students tested in all 3 areas)			
No developmental courses needed	23%	66%	35%
Developmental courses needed	**77%**	**34%**	**65%**
In one area	21%	18%	13%
In two areas	25%	10%	23%
In three areas	31%	6%	28%
DEVELOPMENTAL PROGRESS (n = students identified as needing developmental)			
No developmental courses taken	18%	30%	46%
Dev. course(s) taken/none passed	19%	19%	5%
Course(s) passed/no area completed	19%	13%	18%
Some, but not all areas completed	30%	18%	21%
All developmental work completed	**14%**	**20%**	**10%**
OUTCOMES			
Award and transfer	1%	4%	1%
Transfer, no award	4%	16%	10%
Award, no transfer	3%	5%	2%
Sophomore in good standing	9%	16%	24%
Achievers	**17%**	**41%**	**37%**
Still enrolled	9%	5%	6%
Non-achievers	74%	55%	57%
TOTAL STUDENTS (100%)	1,180	896	174

Note: The numbers of Asian-American, Hispanic-American, and Native-American students were too few for subgroup analysis.

Fall 1990 Entrants After Four Years, by Gender Percentage Distributions			
	Female	Male	Total
AVERAGE CREDIT HOUR LOAD			
Mean term credit load 15+	3%	6%	4%
12 - 14 credit hours	24%	34%	28%
9 - 11	24%	22%	23%
6 - 8	24%	21%	23%
< 6 credit hours per term	24%	17%	21%
CREDIT HOURS EARNED			
No credit courses taken	7%	11%	8%
Credits attempted/none earned	8%	10%	9%
1 - 5 credits earned	16%	16%	16%
6 - 11	15%	14%	15%
12 - 17	11%	9%	10%
18 - 23	8%	8%	8%
24 - 29	7%	6%	7%
30 - 44	12%	9%	11%
45 - 59	8%	8%	8%
60 or more credits earned	8%	9%	9%
CUMULATIVE GRADE POINT AVERAGE			
No credits attempted	7%	11%	8%
0.0 cumulative GPA	8%	10%	9%
0.1 - 0.9 GPA	6%	9%	7%
1.0 - 1.4 GPA	8%	10%	9%
1.5 - 1.9 GPA	10%	9%	9%
2.0 - 2.4 GPA	18%	16%	17%
2.5 - 2.9 GPA	17%	15%	16%
3.0 - 3.4 GPA	16%	13%	15%
3.5 - 4.0 GPA	11%	7%	9%

Percentage Distributions			
	Female	Male	Total
DEVELOPMENTAL EDUCATION ASSESSMENT (n = students tested in all 3 areas)			
No developmental courses needed	41%	44%	42%
Developmental courses needed	**59%**	**56%**	**58%**
In one area	19%	20%	19%
In two areas	19%	18%	19%
In three areas	20%	19%	20%
DEVELOPMENTAL PROGRESS (n = students identified as needing developmental)			
No developmental courses taken	23%	22%	22%
Dev. course(s) taken/none passed	13%	25%	18%
Course(s) passed/no area completed	17%	17%	17%
Some, but not all areas completed	30%	22%	27%
All developmental work completed	**16%**	**14%**	**16%**
OUTCOMES			
Award and transfer	2%	3%	2%
Transfer, no award	9%	10%	9%
Award, no transfer	4%	3%	4%
Sophomore in good standing	14%	11%	13%
Achievers	**29%**	**27%**	**28%**
Still enrolled	8%	6%	7%
Non-achievers	63%	68%	65%
TOTAL STUDENTS (100%)	1,379	1,007	2,386